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THE EAST ASIAN SEAS CONGRESS

25 Years of Partnerships for Healthy Oceans, People and Economies

Moving as One with the Global Ocean Agenda

27-30 November 2018 • Iloilo Convention Center, Philippines

MARINE POLLUTION & CLEAN WATER

TRACK 2: MARINE POLLUTION AND CLEAN WATER

SESSION 2.3

Marine Plastic Pollution: A Global Issue with National and Local Solutions

CONVENERS:

First Institute of Oceanography of China

United Nations Development Programme

Partnerships in Environmental Management for the Seas of East Asia

International Union for Conservation of Nature

The East Asian Seas Congress 2018

25 Years of Partnerships for Healthy Oceans, People and Economies: Moving as One with the Global Ocean Agenda

Iloilo City, Philippines, 27-30 November 2018

Partnership Hub Track 2: Marine Pollution and Clean Water

Session 2.3: Marine Plastic Pollution: A Global Issue with National and Local Solutions

Partnership Hub Session Chair and Co-Chair:

Chair: **Dr. Jose Erezo Padilla**, Regional Technical Adviser, Water and Oceans, Bangkok Regional Hub, United Nations Development Programme (UNDP)

Co-Chair: **Ms. Maeve Nightingale**, Capacity Development Manager, Mangroves for the Future (MFF)

Partnership Hub Session Coordinator: **Cristine Ingrid Narcise**, PEMSEA

1. INTRODUCTION

1.1 The Ocean Conservancy reports that five of the eight largest contributors of plastic waste to the oceans are countries in the East Asian region. In light of this concern, varied efforts and innovations are emerging that can help address the problem at various levels.

1.2 In particular, with the local coastal communities contributing to and experiencing the immediate adverse impacts of plastic waste, this session will look into potential options/approaches, new initiatives and innovative solutions that can help enhance local actions in combating the rising problem of plastic pollution and moving towards circular economy.

1.3 Through a combination of roundtable discussion, presentations and open forums, the partnership hub session aimed to:

a) Discuss the issue of plastic pollution and its impacts on marine and coastal areas especially at the local level, examples of responses from various sectors, significant challenges and opportunities;
b) Explore national, local and transboundary options/ approaches that can be taken to reduce and improve the management of plastic waste;

c) Present local and innovative initiatives to reduce plastic pollution, including solutions that can be considered for 'Closing the Loop' and improving plastic waste management;
d) Examine knowledge and research requirements to understand and address the marine plastics problem properly especially at the local level;
e) Discuss how to develop enabling environment to remove barriers and facilitate coordination and collaboration among agencies at the national and local levels related to the control of and regulation of plastic production and solid waste management; create awareness and change the behaviour of consumers and the private sector on plastic use and waste production; support the identification, demonstration, and scaling up of innovative solutions and local examples of good practices that demonstrate circular economy for plastic waste reduction/management; foster partnership approaches in financing on waste management; etc.

1.4 The Session Chair, **Dr. Jose Erezo Padilla**, opened the session by giving a brief introduction to the current state of marine plastic pollution in the region. He cited the large patches of plastic debris scattered across the pacific, the plastic ingestion of more than half of sea turtles and birds, and the report that the 8 largest plastic polluters are countries found in the East Asia Region.

1.5 The Session Chair then provided an overview of the session, emphasizing that the 3-hour session is expected to highlight potential solutions and recommendations to deal with the increasing problem of plastic pollution in the region.

2. ROUNDTABLE DISCUSSION

2.1 The roundtable discussion was moderated by **Dr. Leah Karrer**, Senior Environmental Specialist of the Global Environment Facility. She introduced the objectives of the session to gather the perspectives of different stakeholders on the issue of plastic pollution, and delivered a presentation to set the context for the discussion.

2.2 While commitments have already been made against the use of single use plastics to prevent and reduce marine pollution by governments at the national and local levels, various international entities such as the ASEAN, APEC, and the European Commission, and a number of corporate/business entities, Dr. Karrer reiterated the big challenge of addressing visible impacts of marine plastic pollution to our ecosystems, and the less visible impacts to human health as evidenced by the microplastics found in food and human waste.

2.3 Dr. Karrer emphasized problems with the current linear economy wherein we 'Take (raw materials from the natural environment), Make (products), and

Dispose (waste)', and with almost all materials being single use plastics. She discussed the need for a circular economy approach addressing all phases of the plastic lifecycle. With the circular economy approach of 'Reduce, Redesign, Reuse, Recycle, and Rethink', we eliminate what we don't really need such as plastic bottles and plastic straws, and be innovative to create reusable or edible or more environment-friendly materials. This way, the amount of raw materials and the amount of residual waste are both reduced.

2.4 Emphasizing the importance of involving all stakeholder groups in the campaign against plastic pollution, Dr. Karrer introduced the roundtable respondents, opening the discussion to the invited representatives from the government, private sector, research institution and financing sector.

2.5 The local government perspectives were represented by **Mr. Gaspar Soares**, Mayor of Dili Municipality, Timor Leste; and **Mr. Prak Visal**, ICM Coordinator and Director of Public Relations and International Cooperation for Preah Sihanouk Province, Cambodia. Dr. Karrer asked each representative about 1) the state of plastic pollution in their respective localities, 2) the two biggest challenges they are faced with regards to reducing plastic pollution, and 3) how they are addressing the issue of reducing plastic production and use, particularly single-use plastics.

2.6 After giving a brief description on Timor Leste, Mr. Gaspar Soares presented the numbers behind Dili's increasing problem of waste pollution. 22 to 23 cubic meters of waste materials are produced by Dili on a daily basis, 50% of which are estimated to be plastic wastes. He added that solid waste management is high on the government's agenda and a policy to reduce the use of plastics is in the process of being developed. Dili has initiated a plastic reduction program. Hopefully within 2019, several municipalities in Timor Leste will also start to implement the policy, and reduce the use of plastic products. The government is also working with the private sector to find alternatives to plastic.

2.7 Mr. Prak Visal of Cambodia described the current status of waste management in Preah Sihanouk Province, stating that due to the increase of the population and investors, the province collects at least 600 trucks of waste per day, most of which are plastics. The government has contracted a company to collect the waste in the city. Various stakeholders, including the local communities, the academe and the private sector, are working together with the local government in the collection and reduction of plastic wastes in their respective areas. Recycling efforts are also underway. Mr. Visal highlighted the limited capacity of the contracted company to collect all the wastes in the area. He also emphasized the need for the private sector to see the importance of reducing plastic wastes in their production processes.

2.8 Dr. Karrer highlighted that actions should happen at the local and national levels, matching their policy framework. This will form part of the global policy framework for plastic waste reduction which will be tabled at the UN Environment Assembly in March 2019.

2.9 Moving forward, Dr. Karrer emphasized that the governments cannot solve the plastic pollution crisis alone. The private sector plays a critical role, which includes providing technology and processes to promote closed loop production and consumption. The insights from the private sectors' standpoint were given by **Mr. Crispian Lao**, Vice Chair and Commissioner of the National Solid Waste Management Commission, and Founder of the Philippine Alliance for Recycling and Materials Sustainability (PARMS); and **Ms. Jacqueline Price**, Director, Cleanup Operations, 4Ocean.

2.10 A multi-stakeholder organization, PARMS is composed of members across the waste management value chain, from production to disposal and recycling, including corporations, industry groups, retailers, haulers, converters, junkshops, MRFs, civil society organizations, academe, and government agencies. Highlighting that waste becomes waste only if it does not have a value, Mr. Crispian Lao emphasized the importance of collaboration across the above sectors, and shared PARMS' program that promotes full recovery and recycling of residual wastes into marketable products. This is done in conjunction with various existing programs of the national and local governments and its members and partners. With regard to specific measures to prevent plastic use or to ban single use plastics, Mr. Lao underscored the importance of collaboration throughout the continuum of businesses, from big brands to small and medium enterprises. He also discussed how the members of PARMS aim to promote a business model wherein the products, packaged or made from recycled and reused materials, are part of the continuous loop of recycle and reuse. Uplifting the recycling industry, there is also merit in re-evaluating production decisions in terms of good solid waste management.

2.11 Ms. Jacqueline Price introduced 4Ocean, an organization that contributes to marine litter reduction primarily by collecting ocean-bound wastes such as glasses and other plastic materials, for recycling and reuse. Working directly with national governments, 4Ocean 1) uses latest technologies to prevent, intercept, and remove trash from the ocean and coastlines; 2) creates employment for local people who are cleaning the ocean and coastlines; 3) strive to educate individuals, corporations, and governments on the impact that plastic has on the ocean including hosting cleanups above and below water to raise awareness and change behavior; and 4) creates a new economy for the removal of trash by giving ocean plastic value through the jobs created and the sale and reuse of reclaimed ocean plastic. One of their most prominent campaigns is the 4Ocean bracelets, which represent the cause and generate funding for the organization's

activities. Ms. Price also noted the increasing awareness of people on marine litter prevention and reduction as seen in the bulk of emails they receive daily, expressing interest to be involved in 4Ocean's activities.

2.12 From the research perspective, **Mr. Wenxi Zhu**, Head of the International Oceanographic Sub-Commission for the Western Pacific (IOC-WESTPAC) provided information on the state of the knowledge on microplastics, and recommendations on how to reduce the plastics entering the ocean.

2.13 Mr. Zhu defined microplastics as pieces of plastic measuring less than 5mm in diameter. These microplastics are either plastic particles or pellets produced for certain applications, or pieces resulting from fragmentation of larger plastic items. These microplastics accumulate on different marine organisms, most especially birds, fishes, and even planktons. In addition, nano-sized microplastics can damage tissues as well as the cell membranes as they are ingested. While microplastics can already be seen on sediments and in many parts of the region, there are still no reliable estimates of their presence in the region.

2.14 He further mentioned that all microplastic issues should be taken into account, and new solutions to address microplastic pollution should be formulated. Confirming what has been previously reiterated by other roundtable respondents, Mr. Zhu advised for better solid waste management practices in order to ensure lesser plastic contamination in the marine environment, such as the strict implementation of the 5R approach (reduce, reprocess, reuse, recycle, and recover). In terms of measuring progress of governments and stakeholders in efforts against marine plastic pollution, monitoring of plastic wastes is important but will not be easy, and will need collaboration among the scientific community and relevant stakeholders. He highlighted the need to identify and monitor the points of entry of plastics into the oceans, most especially the rivers. Plastics in the ocean can be from various sources including mariculture and point sources of pollution can be different from one country to another. He underscored the need to standardize techniques for microplastic sampling and analysis. WESTPAC is currently coordinating a microplastic research and monitoring program that aims to better understand the sources, distribution, fate and impacts of microplastics in the region, and they have developed a guideline for sampling and analysis of microplastics in beach sediment.

2.15 Dr. Karrer introduced the final roundtable respondent, **Mr. Rob Kaplan**, the Founder and CEO of Circulate Capital, representing the financial sector. In his talk, Mr. Kaplan discussed how capital from various sources is circulated to help solve the problem of plastic pollution. He began by talking about the millions of tons of wastes in the oceans that require billions of dollars to address. Financing innovations and solutions that contribute to reducing the flow of plastics to the oceans is critical. Circulate Capital works to enable financing to entities

operating in the solid waste management and recycling sector, but they go beyond providing direct investment capital. They build a market for investors to finance integrated waste and recycling management. They do this by providing catalytic capital (from private and public funds and other sources) to support and develop innovative approaches to waste management and recycling and demonstrate viability of investments, in order to facilitate allocation of bigger funds from public and private institutional investors.

2.16 Mr. Kaplan went on to explain that in order for institutional investors to be engaged, there needs to be a pipeline of investable projects, and there has to be a track record of how other investors have gained from the venture. They have received commitments from several multinational companies (Pepsico, Coca-Cola, Danone, Dow, Procter and Gamble and Unilever) to invest over $100 million to demonstrate innovative and investable solutions to waste management in South and Southeast Asia.

2.17 Circulate Capital aims to enable financing and prove the investment market for operations and technologies in different aspects of waste management, from delivery and collection, to aggregation, recycling and manufacturing, with investment at each stage converting waste plastic to revenue.

2.18 Dr. Leah Karerr invited the audience to share their experiences, insights, or questions.

2.19 Ms. Deborah Robertson from the Asian Development Bank (ADB) shared that ADB is developing a new technical assistance project to countries in the region focusing on addressing marine litter. The project covers strengthening of knowledge and awareness on marine litter and solutions; strengthening enabling environment including developing National Action Plans, policy and regulatory support, and enhancing local government capacity; and promoting regional coordination and high-level commitments.

2.20 Mr. Jerker Tamelander, Head of the Coral Reef Unit of UN Environment, shared that in Surabaya, Indonesia, the Mayor has implemented innovative measures to improve solid waste management at the local level. These include establishment of waste banks to collect recyclable wastes and a system where plastic bottles can be used to pay for a bus ride.

2.21 Mr. Juergen Lorenz of JL Business and Technology Consultancy highlighted that the root cause of plastic pollution may not be the financial aspect but the political side. Due to the need to keep the costs low, investments in waste management facilities have long payback time, but in some cases in the Philippines contracts issued to companies may be affected by political changes.

2.22 Mr. Crispian Lao explained the 'politics of waste'. Local governments (in the Philippines) have control over the waste. Considering the long payback period for investments and the short terms of Mayors, systems have been put in place, such as public-private partnerships, to guarantee investors against political changes. Under this system, contracts are strictly implemented and are monitored by the Department of Interior and Local Government. There is a need to work within the existing system of waste management, work in partnership with various sectors, and work with different models to find out what works.

2.23 Dr. Karrer concluded the roundtable discussion and thanked the respondents and audience for their active participation and inputs.

3. PRESENTATIONS

3.1 The Chair, **Dr. Jose Erezo Padilla**, introduced the next part of the session where five presentations will be delivered to provide examples of initiatives for addressing marine plastic pollution and promoting circular economy solutions.

3.2 **Dr. SUN Chengjun**, Researcher from the First Institute of Oceanography (FIO), SOA/MNR, China, delivered a presentation on Regional Microplastic Research Progress and Collaboration. She began her presentation by showing photos of impacts of plastic debris in the marine environment, including a dead sperm whale in Indonesia that was found with 6 kg of assorted plastic pieces in its stomach. Dr. Sun described microplastics as plastic materials which are less than 5mm in diameter, of various shapes and uneven sizes. These over large surface areas in the ocean and are persistent, deposited in the deep sea, enriching other pollutants, and endangering marine life and ecosystems. Sources of marine microplastics come primarily from plastic particles in various chemical and cosmetic products, and secondarily from the breaking down of large pieces of plastics coming from land, shipping, aquaculture, and tourism. The Great Pacific Garbage Patch is estimated to have at least 79 million tons of plastic for every 1.6 million km2. Microplastics account for 8% of the total mass, and 94% of the approximately 1.8 trillion pieces of plastic are floating in the area.

3.3 Current research fields include the establishment of standardized method for separation and analysis of microplastics; assessment of temporal and spatial distribution of microplastics in various medium (offshore, lakes, rivers, sediments, organisms); evaluating ecotoxic effects of microplastics; establishment of ecological risk assessment system and standards for marine microplastics pollution; and formulation of policies and regulations to control microplastics pollution.

3.4 Dr. Sun discussed their ongoing research work, which includes studies on microplastics in surface seawater and water column; and microplastics in marine

organisms; and establishing a microplastics database. In the recent China-Southeast Asian Marine Cooperation Forum, microplastic pollution was recognized as a transboundary problem at the global scale that needs international collaboration. FIO, which has been active in various international cooperation activities, aims to further strengthen international cooperation and exchange, and work on establishing standard methods and specifications for investigation of microplastics, strengthen research on open ocean microplastics, and conduct intensive studies on the mechanism of migration, diffusion and ecological effect of microplastics.

3.5 **Ms. Sizigia Pikhansa**, Creative and Marketing Manager of Evoware, talked about Evoware's innovative solution to reduce the use of plastics. Acknowledging the social and environmental hazards brought about by plastic pollution, Evoware turned to Indonesia's seaweed as an alternative packaging source.

3.6 With the circular economy as a framework and the seaweed as a renewable source of materials, sustainable products are created such as edible cups and biodegradable and edible packaging for food and non-food products. Since these products are edible and compostable, plastic waste is minimized and waste management costs are reduced. There is also high social impact in the community as it provides livelihood to farmers, the disabled and unskilled workers, and orphanages.

3.7 Educating the market on alternative packaging options remain a challenge, along with financial and technology considerations for scaling up, but Ms. Pikhansa is focusing more on the opportunities of working in support of government priorities and regulations and the SDGs, and towards healthier and more sustainable lifestyle.

3.7 **Ms. Benjamas Chotthong**, Director of Research Service Department of the Thailand Environment Institute (TEI) talked about the Public-Private-People Partnerships on Waste Management in Thailand. She provided an overview on waste generation and management in Thailand, which generates over 27 million tons of waste, 60% of which are plastic, and contributes 1 million tons of marine debris per year. Solid waste management has become a national priority since 2014, with key stakeholders from the government, private, and public spheres engaged as partners in taking concrete actions.

3.8 As responsibilities for waste management involve several government agencies and departments, the National Environmental Committee (NEC) has established a Plastic Waste Management Subcommittee that was tasked to focus on public relations, policy-driven mechanisms, and research and development on circular economy.

3.9 The NEC works with the private sector through the Federation of Thai Industries (particularly their Plastic Business Group), retail business companies, and the Thailand Business Council for Sustainable Development); and with the people through the local communities, schools and universities and public areas. Single use plastics have been banned in national parks and some universities, and are not provided in some retail stores on selected days. Various campaigns are promoting the shift to biodegradable packaging such as bioplastics and reusable cups

3.10 Supported by local government and local stakeholders, zero waste communities and zero waste schools are recognized and awarded for their efforts to reduce waste from point sources and increase waste segregation, recycling, and utilization.

3.11 Ms. Chotthong noted that small pieces of plastic usually do not get into the recycling process and become waste, managing the flow of plastic from upstream to downstream areas remains a big challenge, and actions taken on plastic wastes still seem too small to effect real changes. Strong control and commitment are needed to effectively address the issue.

3.12 **Ms. Buithithu Hien** of IUCN, Vietnam and **Ms. Siriporn Sriaram** of IUCN Thailand shared the status of the plastic pollution problems in their respective countries, and the solutions put forward by the MARPLASTICCS (Marine Plastics and Coastal Communities), a 3-year Initiative (2017-2020) across 5 countries in Asia and Southeast Africa. The main outputs of the initiative are anchored on four pillars: Knowledge (Better understanding of the state and impact of and solutions to plastic pollution); Capacity Building (To support coordinated national action to control plastic pollution), Policy (Recommendations for improving existing national and regional policy, legal and regulatory frameworks), and Business (Engage and mobilize business sectors to reduce the plastic footprint of their operations).

3.13 Speaking on Thailand's plastic pollution and waste management solutions, **Ms. Siriporn Sriaram** enumerated Thailand's several initiatives that aim to address plastic pollution:

- 154 national parks in the country ban the use of single-use plastics;
- More than 20,000 ships voluntarily clean Thailand's seas, enjoined by local fishermen who have caught more plastics than fishes;
- Pilot marine protected areas have been launched in Samui, PhaNgan, and Tao Islands;
- Upcycling the Oceans, Thailand was implemented through the collaboration of the Tourism Authority of Thailand (TAT), PTT Global Chemical Company Limited Public) (PTT GC) and Ecoalf Foundation, with the goal of plastic waste

management in Thai marine tourism destinations and the conservation and restoration of marine ecosystems.

3.14 She also described some local solutions that are creating awareness on the importance of waste segregation and the value of reusable and recyclable wastes such as plastics. Following the four pillars of the MARPLASTICCS initiative, one of the recommendations for Thailand is to promote conversion of waste to energy including:

- Piloting models with Public-Private-Partnerships (PPP)
- Amending laws to reflect the real cost of waste management
- Promoting recycling businesses by providing tax incentives
- Knowledge and awareness raising
- Capacity building

3.15 Ms. Siriporn Sriaram shared the way forward for Thailand with regard to hierarchy of strategies for integrated waste management hierarchy, from the most preferred to the least preferred as follows:

- Reduction (cleaner production, sustainable consumption and prevention)
- Reuse (reusing waste in current form)
- Recycling and Composting (processing waste to recover commercially valuable products)
- Recover (recovering energy from waste)
- Residuals (safe disposal in a landfill)

3.16 Citing the fact that Vietnam is the fourth largest plastic pollution contributor, **Ms. Buithithu Hien** described the status of the country's plastic pollution and its negative impacts to emphasize the need for a collaborative action among the communities and the government. Through the MARPLASTICCS initiative, the following will be developed/implemented:

- Knowledge deliverables: Scoping and review of the state of knowledge on plastic pollution, targeted research on plastic waste fluxes, priorities, targeted solutions, documentation and awareness raising on best practices, etc.
- Capacity deliverables: Enhanced capacity of the governments, communities and other stakeholders for coordinated actions to control plastic pollution through stakeholder analysis and mapping, platforms for cooperation and innovation, citizen-science initiatives, and forums to showcase different sustainable solutions;
- Policy deliverables: Assessing effectiveness of existing policy, legal and regulatory frameworks on plastic pollution, providing recommendations for policy or legal actions or reforms, engaging policy makers, and preparation of national action plan;

- Business deliverables: Engaging the private sector by enabling platforms for discussion and cooperation (e.g., Vietnam Business for Environment Platform), assisting them to assess the plastic footprints of their operations and value chain, encouraging economic and financial analysis of control and repurposing options, and engaging them in clean-up and restoration.

3.176 To conclude her presentation, Ms. Buithithu Hien cited the strengths and challenges faced by Vietnam's pollution problem, as follows:

Strengths

- Waste management is one of seven priority programs of the National Strategy for Environmental Protection.
- The National Strategy on Integrated Solid Waste Management sets ambitious targets and provides for charging sanitary fees from waste generators.
- Vietnam encourages private sector and foreign investment, and Vietnam's amended constitution 1992 recognizes the role of the private sector in the economy.
- Provision of financial support for environmental protection activities (including 3R activities) through the Vietnam Environment Protection Fund (VEPF).
- Vietnam has already developed a plan to deal with solid waste by 2025, which focuses on recycling (National strategy for integrated solid waste management to 2025, vision to 2050)

Challenges

- Despite an exemplary early mover initiative for integrated waste management, a lack of action plans and adequate funding to meet the ambitious targets.
- Mechanisms for revenue collection are insufficient and far from full-cost recovery.
- Opportunity to attract more private investments and increase the national budget allocation toward waste management.
- Need for greater transparency and control of private sector monopolies.
- Overlapping roles and responsibilities among agencies involved in waste management.
- Vietnam does not have the facilities to achieve NAP on solid waste management goal. Most waste is simply being dumped -from left-over food to plastic bags, rubber, and plastic straws -into landfill sites across the country, where it is left unsorted and untreated.

3.18 **Ms. Floradema Eleazar**, Programme Manager for the Inclusive and Sustainable Development Unit, UNDP Philippines, presented on Supporting a Circular Economy Approach to Reduce Plastics Pollution in Asia.

3.19 Reiterating the global plastics issue and the magnitude of the problem in Asia, she enumerated the root causes and barriers to change, including:

- Lack of infrastructure for proper waste collection and management - China, Indonesia, the Philippines alone already make up 50% of plastic leakage into the ocean; 75% of this leakage comes from uncollected waste, 25% comes from waste escaping the collection system;
- Inadequate institutional mechanisms and investments, including the lack of regulations and the lack of clear responsibility and accountability mechanisms for transboundary marine plastic waste (as it is difficult to pin identify sources of wastes already at sea, it is better to reduce the waste at the source);
- Lack of data on hazards, risks, impact and mitigation measures in relation to marine plastic pollution; and
- Limited coordination and conflicting objectives across economic sectors - Plastic waste moves along ocean currents, becoming a regional problem; but there is a legal gap in the global governance structure relating to marine plastic litter and microplastics. There are:
  - no legally binding instrument dedicated to tackling marine plastic pollution
  - no agreed pollution reduction targets
  - no agreed uniform obligation to develop national action plans
  - no agreed safe plastic production rules
  - no globally agreed standards for reporting and monitoring of plastics discharge and effectiveness of pollution reduction measures.

3.20 To address the problem on marine plastic pollution, Ms. Eleazar emphasized the need to support the transition to circular plastics economy in South and Southeast Asia. In particular, she recommended the following:

- Developing an enabling environment to support circular plastics economy including:
  - Improving tracking and assessment of the plastics value chains; and
  - Enhancing the enabling environment at the regional and national levels to support innovative circular plastics solutions by:
    - Facilitating agreements towards long term sustainable production of plastics or production of alternatives;
    - Developing ‘multi country agreements’ focusing on incentives and disincentives to promote sustainable production and consumption of plastics and other material innovations;
    - Developing national and sub-national policies/regulations on sustainable consumption for scaling up innovations to reduce, recover and reuse plastics; and

  - Overall strengthening of the innovation and acceleration community infrastructure in the region.
- Mobilizing finance and investments, including building strategic partnerships between social impact investors, plastic producers, and countries with new generation of local entrepreneurs/ innovators; and initiating the creation of locally appropriate financial mechanisms for long term support to the generation and implementation of innovations
- Implementing solutions towards sustainable production and consumption of plastics, including developing actual projects in priority locations in each participating country that adapts material and design innovation; and
- Knowledge management and sharing to continually foster understanding of best practices, innovative solutions and approaches to tackling plastic pollution.

4. PANEL DISCUSSION AND OPEN FORUM

4.1 After the presentations, **Ms. Maeve Nightingale**, Session Co-Chair, proceeded to introduce the panel discussion and open forum.

4.2 The discussion, moderated by **Dr. Gil Jacinto,** Professor at the Marine Science Institute, University of the Philippines, brought forth many interesting points, including the following:

- Public policies, business practices, and human behavior are the major obstacles in addressing the issue on plastic wastes.

- Education and awareness campaigns are necessary to promote change in human behavior on the use of plastics. In parallel, use of plastic materials and single-use plastic bags should be disincentivized (e.g. banning single-use plastic bags, or charging higher fees for a plastic bag to encourage use of recyclable bags). People should also be provided with options or alternatives to plastics.

- Recycling industries should be supported, including creating a market for recycled materials, but there should also be reduction in the production of plastics from the manufacturers' side as well. The reduction of plastics in the market should be dealt with within the value chain itself.

- Plastic resin itself is too cheap and there is a need to tax the resin to reduce the production of plastic.

- In designing and promoting alternatives to plastics, caution should be exercised to ensure that they do not introduce new problems. Most of the

biodegradable plastics in the market are not completely biodegradable. Their decomposition into smaller pieces is just hastened, turning them into microplastics, which makes the problem more serious.

- Apart from the intake of plastic particles, adverse health impacts can arise from the proteins, metals and microbes attached to the microplastics which are ingested by marine organisms, and eventually by humans that consume these as food. Promoting the adverse health impacts of microplastics to human health may help reduce the use of single-use plastics.

- The benefits of introducing alternative packaging materials should also be weighed against potential adverse impacts of producing them, or arising from developments/changes in the sector that produces the raw materials.

- Collection, reuse, recycling and proper disposal of plastic waste should be part of an integrated waste management system.

- The level of plastic reduction we have today should be doubled in the next couple of years.

5. SYNTHESIS AND WRAP-UP

Ms. Maeve Nightingale facilitated the synthesis and wrap up for the session, with a summary of key points from the 3-hour session.

5.1 Session 2.3 brought together a range of stakeholders representing national and local government, private, research and financing sectors to discuss the issue of marine plastic pollution.

5.2 Setting the scene with cases from local government representatives from Dili and Sihanoukville the participants shared insights and ideas fundamental to addressing the issue of marine waste pollution including recognition that there are three things that need to change in order to succeed - business practices, policies and human behavior.

5.2 The session recognized the need to:

- Work in partnership across government, business and society to change the current paradigm and threats to environment and human health caused by mismanaged plastic
- Look at integrated waste management systems as a whole
- Develop policies that consider the plastic problem and proposed alternatives holistically, considering potential impacts of various options

- Promote value creation from wastes, including waste reuse, recycling, upcycling, recovery, and promoting/creating a market for recycled materials
- Further develop business models and social enterprises for reducing plastic wastes, considering sustainable options with costs producers will bear
- Support proper education of consumers and implement market-based instruments to promote change in behavior towards reducing the use of single-use plastics

5.3 The session also heard about various impacts of microplastics on ecosystems and human health and the need for further research on the sources, distribution, fate and impacts of microplastics.

5.4 The session identified that there is a growing demand for alternatives to traditional plastics, such as biodegradable materials, but agreed on the need for these to be genuinely sustainable and safe to environment and human health.

5.5 It was also recognized that 'waste is politics' and while investors are seeking long term pay backs on investments it is essential to work with the prevailing power dynamics to create investment opportunities, and at the same time endeavor to improve equity in benefit sharing.

5.6 The transboundary nature of marine plastic pollution and the imperative for countries in Asia to solve the problem at the regional and national levels was also acknowledged.

5.2 The most urgent challenges to addressing the problem of marine plastic pollution and developing a circular economy in the region remain:

- the need for coordination, collaboration and public-private partnership development;
- the reconciliation of conflicting objectives across economic sectors;
- the need for a legally binding agreements for stopping the flow on plastics,
- the establishment of an enabling environment to support circular economy;
- finance and investment;
- responsible production and consumption;
- data and research; and
- knowledge management, sharing, and education for improved stakeholder engagement.

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ANNEX 1
WORKSHOP PROGRAM

Time	Activities
13:30 – 13:35	**Introduction by the:** **Chair: Dr. Jose Erezo Padilla**, Regional Technical Adviser, Water and Oceans, Bangkok Regional Hub, United Nations Development Programme (UNDP) **Co-Chair: Ms. Maeve Nightingale**, Capacity Development Manager, Mangroves for the Future (MFF)
13:35 – 14:30	**Roundtable** **Moderator:** Dr. Leah Karrer, Senior Environmental Specialist, Global Environment Facility (GEF) The roundtable will aim to gather the perspectives of different stakeholders on the issue of plastic pollution and its impacts on marine and coastal areas; how it is being addressed (or not adequately addressed) especially at the local level; significant challenges, gaps and needs; strategic approaches at the national, local and transboundary levels; innovative/alternative/circular economy solutions and how these can be demonstrated/promoted; and how they are contributing to address the issue. **Roundtable Respondents:** • Mr. Gaspar Soares, Mayor, Dili Municipality, Timor-Leste • Mr. Prak Visal, Director of Public Relations and International Cooperation, Preah Sihanouk Province, Cambodia • Mr. Wenxi Zhu, Head, IOC Sub-Commission for the Western Pacific (IOC-WESTPAC) • Mr. Crispian Lao, Vice Chair and Commissioner, National Solid Waste Management Commission, and Founder of the Philippine Alliance for Recycling and Materials Sustainability • Ms. Jacqueline Price, Director, Cleanup Operations, 4Ocean • Mr. Rob Kaplan, Founder and CEO, Circulate Capital Inputs from the audience may also be considered.
14:30 – 15:30 1430-1442 1442-1454	**Presentations:** Examples of sustainable approaches and innovative/alternative/circular economy solutions for minimizing plastic wastes and reducing marine plastic pollution at the local level will be shared. • Regional Microplastic Research Progress and Collaboration (Dr. SUN Chengjun, Researcher, FIO, SOA/MNR, China) • Innovative Solutions from Seaweed (Ms. Sizigia Pikhansa, Creative and Marketing Manager, Evoware)

1454-1506 1506-1518 1518-1530	• Public-Private-People Partnerships on Waste Management (Ms. Benjamas Chotthong, Director of Research Service Department, Thailand Environment Institute) • Plastic waste pollution and management challenges and opportunities for Vietnam and Thailand (Ms. Buithithu Hien, IUCN, Vietnam and Ms. Siriporn Sriaram, IUCN, Thailand) • Presentation of a UNDP-PEMSEA Concept "Supporting a Circular Economy Approach to Reduce Plastics Pollution in Asia" (Ms. Floradema Eleazar, Programme Manager, Inclusive and Sustainable Development Unit, UNDP Philippines)
15:30 – 15:45	**Coffee Break**
15:45 – 16:15	**Panel discussion and Open Forum** **Moderator:** Dr. Gil S. Jacinto, Professor, Marine Science Institute, University of the Philippines **Panelists:** Presenters The presenters will be addressing questions or clarifications from the moderator on their presentations/solutions and the issue of reducing marine plastic pollution, including the following: • Barriers in developing/sustaining the local initiatives/solutions, and how these were/can be overcome • Knowledge and research gaps/needs to improve understanding of the issue and development of better solutions • Strategies and opportunities for scaling up/replication, developing collaborations, investments, and engaging private sector and development partners Questions and inputs from the audience (in relation to the roundtable and panel discussion) will also be considered.
16:15 – 16:45	**Synthesis and wrap up** The Session Chair, Co-Chair and Moderators will facilitate discussions on the conclusions and recommendations from the session

ANNEX 2
RESOURCE PERSONS

2A. Chair, Co-chair, and Moderators

Dr. Jose Erezo Padilla has been with the United Nations Development Program – Global Environment Finance (UNDP-GEF) team since April 2010 as the Regional Technical Advisor for Water and Oceans. He is based at the Bangkok Regional Hub and covers the entire Asia-Pacific region. He oversees and contributed to or led the conceptualization of a number of innovative programs and projects including the Pacific Ridge-to-Reef Program covering 14 Pacific SIDS and the ongoing SDS-SEA Scaling-Up project which has been implemented by PEMSEA Resource Facility. His diverse portfolio of more than 15 programs and projects covers over 20 countries. Prior to joining UNDP, he was the ADB-GEF Senior Project Development Specialist with the Asian Development Bank (2005-2010), the Senior Policy Officer with the Worldwide Fund for Nature (WWF) in 2000-2005 and the Deputy Chief of Party for the Philippine Environmental and Natural Resources Accounting Project from 1996-2000. He obtained his doctoral degree in economics from Simon Fraser University in 1991 and completed a post-doctoral fellowship with the International Center for Living Aquatic Resources Management (now World Fish Center) in 1994. He may be reached at jose.padilla@undp.org.

Ms. Maeve Nightingale is a marine scientist with more than 20 years of international experience working with International Development Organizations, providing technical advice, managing projects, monitoring and evaluation, implementing integrated and participatory approaches, facilitating capacity building and supporting institutional strengthening. Ms Maeve Nightingale is currently a Senior Programme Officer for the IUCN Coastal and Marine Programme in Asia - Mangroves for the Future (MFF), an 11 country regional initiative working to build resilience of coastal ecosystems and coastal resource dependent communities.

Ms Maeve Nightingale is also the Regional Coordinator for the IUCN MARPLASTICCs project in Asia, an initiative on Marine Plastics and Coastal Communities funded by the Swedish International Development Cooperation Agency (Sida), and working closely with governments, industries and society in Asia (in particular Thailand and Vietnam) to reduce and control plastic pollution.

Dr. Leah Bunce Karrer is an international marine conservationist experienced in building, advising and executing large global initiatives with emphasis on science-to-action and socioeconomics. Leah is a Senior Environmental Specialist with the Global Environment Facility where she works on ocean, freshwater and circular economy initiatives particularly in Asia. Previously Leah served as Deputy Chief Economist at the National Oceanic and Atmospheric Administration, directed Conservation International's Marine Science Program, and founded and directed the Global Socioeconomic Monitoring Initiative for Coral Reef Managers. She earned the Bronze Mead Service award from the U.S. Department of Commerce and the Head in the Sky Award from Conservation International, has published numerous articles and lectured at conferences and workshops worldwide.

Dr. Gil S. Jacinto is currently a Professor at the Marine Science Institute of the University of the Philippines Diliman. In May 2017, he was appointed Director of the Office of International Linkages and Vice President for Academic Affairs in charge of internationalization. Dr. Jacinto is also a member of the Scientific Advisory Group of the UNESCO-Intergovernmental Oceanographic Commission Sub-Commission for the Western Pacific (IOC-WESTPAC). He served as Regional Coordinator for Marine Pollution Monitoring and Information Management of the GEF/UNDP/IMO Regional Programme for the Prevention and Management of Marine Pollution in the East Asian Seas (PEMSEA); and was the National Technical Focal Point (Philippines) for the GEF/UNEP South China Sea Project on Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand. He was co-principal investigator for the development of regional models of coastal effects focusing on Manila Bay for the GEF/UNEP Global Foundations for Reducing Nutrient Enrichment and Oxygen Depletion from Land Based Pollution. In 2016, Dr. Jacinto was invited to join the high level expert group of the UNESCO-IOC Global Ocean Oxygen Network (GO_2NE). To highlight and encourage work on deoxygenation in East Asia, he proposed and coordinates an IOC-WESTPAC technical working group, the Western Pacific Ocean Oxygen Network (WESTPAC O_2NE). Dr. Jacinto earned his Ph.D. in Marine Chemistry from the University of Liverpool, England.

2B. Roundtable Respondents

Mr. Gaspar Soares is the President Authority of Dili Municipality who has been appointed since 2012 to date (2018) from the Ministry of State Administration, the Republic Democratic of Timor-Leste. His higher education was Master's Degree in Business Administration (MBA), Human Resources Management/Personnel Administration at the University of Merdeka Malang-Indonesia (2009 - 2011).

Mr. Prak Visal, is Director of Public Relation and International Cooperation Division, Preah Sihanouk Provincial Hall and Coordinator for Integrated Coastal Management Program in Preah Sihanouk Province, Cambodia.

Prak Visal has been the technical officer of the Project Management Office for the ICM Program in Preah Sihanouk Province, Cambodia for thirteen years. He participated in several national, regional and international capacity-building activities to support the ICM program implementation. He was involved in the implementation of various projects such as the formulation and implementation of the Sihanoukville Coastal Strategy, which covers coastal use zoning, sustainable beach tourism development and management, solid waste management, fishery resources rehabilitation and livelihood management and he also participated in the formulation of provincial five-year work plan and three-year rolling plan of Preah Sihanouk Province.

Mr. Wenxi Zhu currently leads the regional Office for the Western Pacific and its adjacent regions (WESTPAC) of the Intergovernmental Oceanographic Commission of UNESCO (IOC/UNESCO), the competent agency within UN system for marine research, observations and services, and capacity development.

Since joining UNESCO in 2006, he has been promoting marine science development and cooperation in the region, instrumental in providing strategic and programmatic directions, building partnerships, and enhancing research capacity and advancing scientific knowledge of individuals, institutions and countries in the region.

He has been playing a pivotal role in the development of a broad spectrum of collaborative ocean related programmes that aim to address social, economic and environmental concerns in the region. Working closely with various marine scientific community, he has initiated the ***regional network monitoring the ecological impacts of ocean acidification on coral reef ecosystems*** and *the* ***UNESCO/IOC regional network of training and research centers on marine***

***sciences*,** which were documented as voluntary commitments to the Sustainable Development Goal 14 of the UN 2030 Agenda for Sustainable Development. He is also *leading the development of a microplastic research and monitoring network in the region.*

Although Wenxi received education on marine engineering and marine environmental science from the Dalian University of Technology and the Ocean University of China respectively, his more than twenty years' career has been inextricably linked with ocean, enabling him to acquire multi-disciplinary knowledge and extensive experience ranging from marine policy, ocean governance, marine science and science-policy interface. As a credit to his quality work, he was accepted in 2011 into the long running and highly prestigious U.S. International Visitor Leadership Programme (IVLP).

Commissioner Crispian Lao is the Vice Chairman of the National Solid Waste Management Commission under the Office of the President, Republic of the Philippines, as the Private Sector Representative for the Recycling Industry and is a Co-Convener and Founding President of the Philippine Alliance for Recycling and Material Sustainability (PARMS) which brought together stakeholders in the recycling value chain (Manufacturers, Industry Groups, Retail Groups, MRFS/Junkshops/Waste Consolidators & Haulers, Recyclers, NGOs, Academe and Government Entities) whose objective is to "Develop and Implement a Holistic & Comprehensive Program to Increase Resource Recovery and Reduce Landfill Dependence towards Zero Waste".

Within APEC, Mr. Lao also serves as the Co-Chair and Industry Sector Representative to the APEC Virtual Working Group on Marine Debris. He is a technical working group member of the Climate Change Commission; board member of the Solid Waste Management Association of the Philippines; and part of the expert panel that will develop a Global Roadmap to Achieve Near Zero Ocean Plastic Leakage by 2040.

Ms. Jacqueline Price is the Director of International Operations at 4ocean (www.4ocean.com), a global company that is actively removing trash from the ocean, river mouths and coastlines, while inspiring individuals to work together for cleaner oceans, one pound at a time. As of November 20th 2018, 4ocean has removed over 2.3 million pounds of plastic and trash from the ocean in just 16 months. Jackie leads all 4ocean operations in Haiti, Indonesia and other international markets. She previously served in leadership positions in Asia and the U.S. at two global marketing agencies and is a dynamic leader with a focus on accelerating organizational growth through global partnerships, innovative program design, strategic marketing and seamless project management.

Mr. Rob Kaplan is Founder and CEO of Circulate Capital, an impact investment management firm dedicated to financing companies, projects, and infrastructure that prevent the flow of plastic waste to the world's ocean and advance the circular economy. He is also a Co-Founder of and Senior Advisor to Closed Loop Partners, which deployed more than $40M into recycling and circular economy investment opportunities in North America; previously as Managing Director, Rob oversaw strategy and new business model development, as well as day-to-day operations.

Rob also served as Director of Sustainability for Walmart Stores, Inc. where he was responsible for packaging, customer engagement, and integration with the Consumables business, including personal care and household cleaning, leading the company's cross-functional efforts to eliminate 20 million metric tons of greenhouse gas from the supply chain. Before joining Walmart, Rob helped lead corporate responsibility and brand strategy for Brown-Forman Corporation, which produces and markets spirit brands such as Jack Daniel's.

Rob developed marketing strategies to engage consumers, improve social and environmental performance, and advance business objectives. He received his MBA from the Haas School where he studied marketing, corporate responsibility, and social entrepreneurship. Prior to graduate school, Rob was State Communications Director for Fight Crime: Invest in Kids California and a political consultant for M&R Strategic Services in Washington, DC. Rob received his undergraduate degree in political communication from the George Washington University where he learned that perception is reality.

2C. PRESENTERS

Dr. Sun Chengjun obtained her Ph.D degree in Life Science from the University of California, Santa Barbara. She has been working in the fields of marine chemistry, marine biochemistry, and biomaterial, focusing on biofouling organisms and hadal chemical environment. In the past few years, she has been taking the lead on marine microplastic research and is actively involved in international microplastic research, especially in South-East Asian countries. Dr. Sun is in charge of projects from national 973 programs and the National Natural Science Foundation of China. She has awards as Taishan Scholar of Shandong Province and Creative Talents of Qingdao city.

Ms. Sizigia Pikhansa is an environmentalist and communication strategist specifically in the sustainability field with past experience in creative agencies. She actively support communities, social enterprises, non - governmental organizations, schools and other institutions that focus on solving sustainable issue and work with them to create awareness and push sustainable living through creative programs & contents. Right now she works with Evoware as Creative and Marketing Manager to handle all online & offline marketing and communication strategy. She also co-found Project Semesta, a local community that aim to build economic system based on sustainable practices.

Ms. Benjamas Chotthong is currently the Director of Research Service Department of the Thailand Environment Institute. She has over 25 years' experience in project management and research through various projects focused on participatory approaches for ecosystem and biodiversity management and sustainable livelihood, local environmental and community-based management, including policy and plan monitoring and evaluation. She obtained her Bachelor of Science on Fisheries Management in Kasetsart University (1988-1992), and Master of Science in Technology of Environmental Management in Mahidol University (1992-1996), and is currently a Ph.D. Candidate (Public Policy and Administration) in Mahidol University.

Mrs. Bui Thi Thu Hien, Marine and Coastal Resources Programe Coordinator at IUCN – International Union for Conservation of Nature (Viet Nam Office). She graduated from Biology Department, Viet Nam National University in 1993 and Master of Science at the Department of System Ecology, Stockholm University, Sweden in 1997. Since October 1998 till now, she works for IUCN, Marine and Coastal Program from Project Support Officer to Program Officer and now she is the Coordinator to the Program.

As Coordinator of the IUCN Vietnam Marine and Coastal Program, she coordinated all key activities under the programme that included: (1) Provision of technical and policy support to the implementation and development of Vietnam's National System of Marine Protected Areas; (2) Support Viet Nam the development and implementation the Marine turtle Conservation Action Plan (MTCAP) (2004-2010) and update MTCAP for period 2016-2025 with its priorities activities that focuses on community based marine turtle conservations; (3) Provide technical assistance to strengthen the institutional capacity of the Ha Long Bay World Heritage Site Management Department; (4) Supported and coordinated the development and implementation ICM, MSP and Ridge to Reef in differences coastal provinces; and (5) From 2010 till 2016, coordinated Viet Nam Mangroves for the Future Initiative (MFF) with its priorities focus on Climate change adaptation following ecological system based approach, green growth. Consider coastal ecological system is nature infrastructure and the core element for coastal area resilience. Since 2018, coordinate Viet Nam's Marine Plastic Pollution activities under the IUCN global initiative MarPlasticcs focus on Policy, Knowledge, Capacity and Businesses.

Ms. Siriporn Sriaram, is MARPLASTICCs Thailand's focal point and Mangroves for the Future (MFF) Thailand's National Coordinator, IUCN Thailand. Siriporn is the member of IUCN Commission on Education and Communication (CEC).

Ms. Floradema Eleazar is a professional Environmental Planner. She obtained her BS in Forestry from UP Los Banos and MA in Urban and Regional Planning from UP DIliman. She also obtained a Special Certificate from Harvard Institute for International Studies on Environmental Economics and Policy Analysis.

She spent more than 19 years in government, mainly DENR in designing, implementing and managing ENR programmes. She served as Manager of three major

projects, namely: UNDP Integrated Environmental Management for Sustainable Development; WB-DoF Community Based Resource Management Project; and the UNDP-GEF-DENR New Conservation Areas in the Philippines Project. She worked as Independent Consultant to UNDP, World Bank, ADB and DFAT for almost 15 years prior to joining UNDP in August 2016.

She is currently the Programme Manager of the UNDP Inclusive and Sustainable Development Team which manages the organization's portfolio on environment and natural resources management, climate change and disaster risk reduction and management.